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# ***U.S. PATENT APPLICATION***

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***Invention:*** COSMETIC OR DERMATOLOGICAL COMPOSITION COMPRISING AT  
LEAST ONE ALKYNYL CARBAMATE AND AT LEAST ONE POLYOL

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## ***SPECIFICATION***

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Cosmetic or dermatological composition comprising at least one alkynyl carbamate and at least one polyol.

The present invention relates to cosmetic or dermatological compositions comprising at least one alkynyl carbamate and at least one polyol; to the use of these compositions in cosmetics; and to the use, for the preparation of a cosmetic or dermatological composition, of an alkynyl carbamate and a polyol for treating inflammatory and/or desquamating skin disorders associated with *Malassezia* spp.

Desquamating disorders of the scalp such as dandruff and seborrhoeic dermatitis are associated with the presence of a characteristic yeast known as *Malassezia ovalis*, which was previously known as *Pityrosporum* (*P. ovale* and *P. orbiculare*).

Moreover, it is known that this yeast is capable of changing its shape and metabolism. In particular, it can change into a filamentous form (*Malassezia furfur*) which is responsible for the inflammatory and pigmentary disorder known as Pityriasis versicolor.

The usual treatment for all these complaints involves using antifungal agents in a medium, such as a shampoo, a gel or a lotion, which is suitable for distributing these agents and depositing them on teguments.

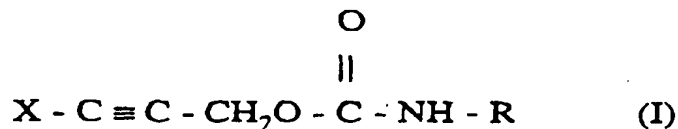
The antifungal activity of these agents is limited; furthermore, the persistence of the antifungal activity is low. Thus, treatments using these antifungal agents are of very moderate or even low efficacy.

The Applicant has thus sought to solve these problems and to obtain more effective treatments.

It has discovered, surprisingly, that by combining an alkynyl carbamate with certain polyols, it is possible to obtain treatments that are much more

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• at least one alkynyl carbamate of formula (I) below:



in which:

X denotes a halogen atom

R denotes a hydrogen atom,

an alkyl group,

a hydroxyalkyl group,

and at least one polyol chosen from non-etherified polyols,  $\text{C}_1\text{-C}_{10}$  (poly)alkyl or  $\text{C}_2\text{-C}_{20}$  (poly)alkenyl polyol ethers and glycosyl polyol ethers; the polyol being saturated or unsaturated, linear, branched or cyclic, bearing or not bearing a hetero atom, and bearing or not bearing additional chemical functions chosen from carbonyl and carboxyl functions.

In the context of the present invention:

the term "halogen atom" denotes a fluorine, chlorine, bromine or iodine atom and preferably an iodine atom.

The term "alkyl group" denotes linear or branched groups containing from 1 to 20 carbon atoms, such as, for example, octyl, nonyl, decyl, dodecyl or pentadecyl groups. The term "alkyl group" preferably denotes lower alkyl groups containing from 1 to 4 carbon atoms in a linear or branched chain, such as, for example, methyl, ethyl, propyl, isopropyl, n-propyl, butyl, n-butyl or tert-butyl groups.

The compositions of the invention preferably contain compounds of formula (I) in which X denotes an iodine atom and R denotes a lower alkyl group containing from 1 to 4 carbon atoms.

Even more preferably, they contain at least 3-iodo-2-propynyl butylcarbamate.

According to the invention, the polyols represent saturated or unsaturated, linear, branched or

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Among these compounds, mention may be made of erythritol, arabitol, adonitol, sorbitol, dulcitol, 1,2-butanediol, 1,3-butanediol, 1,4-butanediol, 2,3-butanediol, 1,5-pentanediol, 2,4-pentanediol, 2-methyl-2,4-pentanediol, 1,6-hexanediol, 2,3-dimethyl-2,3-butanediol, 2,2-diethyl-1,3-propanediol, 2-ethyl-1,3-hexanediol, 2,2,4-trimethyl-1,3-pentanediol, 2-ethyl-2-butyl-1,3-propanediol, 1,2,4-butanetriol, 1,2,6-hexanetriol, 2,2-dihydroxymethyl-1-butanol, tetramethylolmethane (pentaerythritol), glyceryl  $\alpha$ -monomethyl ether, glyceryl  $\alpha$ -mono-n-butyl ether and 2-O- $\alpha$ -D-glucopyranosyl-L-ascorbic acid.

The alkynyl carbamate and the polyol can be simultaneously present in individual proportions or between 0.001% and 10% by weight relative to the total weight of the composition and preferably in proportions of between 0.01% and 5% by weight relative to the total weight of the composition.

The compositions of the invention can have a pH of between 2 and 12.

The physiologically acceptable medium generally consists of water or of mixture of water and at least one organic solvent which is physiologically acceptable for the purpose of topical application. Among the solvents which may be mentioned are C<sub>1</sub>-C<sub>4</sub> lower alcohols such as ethanol, isopropyl alcohol, alkylene glycols such as propylene glycol, ethylene glycol monobutyl ether, and propylene glycol and dipropylene glycol mono(or di)ethyl(or methyl) ether. When they are present, these

solvents preferably represent from 1 to 80% by weight relative to the total weight of the composition.

The compositions according to the invention can be in the form of lotions, shampoos, mousses, creams, gels, sticks, sprays, balms, powders or solid or liquid soaps.

The compositions in accordance with the invention can optionally also contain various additives other than those defined above, which do not adversely affect the properties of the compositions of the invention, such as anionic, amphoteric, zwitterionic or nonionic surfactants, suspending agents, anionic, nonionic, cationic or amphoteric polymers, proteins, silicone oils, waxes, resins and/or gums, acidifying or basifying agents, preserving agents, fragrances or other adjuvants commonly used in cosmetics or dermatology.

The compositions according to the invention can also contain other antibacterial agents such as those described above, for instance chloramine T, Irgasan DP 300, chloramine B, 1,3-dibromo-5,5-dimethylhydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 3-bromo-1-chloro-5,5-dimethylhydantoin or N-chlorosuccinimide.

They can also contain antifungal agents such as, for example, selenium sulphide, zinc pyrindinethione or octopyrox.

A subject of the invention is thus the use of a composition as defined above for the cosmetic treatment of the hair and the scalp.

A subject of the invention is also the use of a composition as defined above, as an antifungal cosmetic composition.

More particularly, the compositions of the invention are preferably used as antidandruff cosmetic compositions.

The invention also relates to the use of alkynyl carbamate as defined above and of at least one polyol as defined above for the preparation of an

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antifungal dermatological composition or for the preparation of a dermatological composition intended for the treatment of inflammatory and/or desquamating skin disorders associated with *Malassezia* spp. and more particularly antidandruff treatment.

A subject of the present invention is also a cosmetic treatment process in which the cosmetic compositions according to the invention are used to eliminate dandruff from the hair and the scalp, and they are applied, in this case, to wet or dry hair; these applications optionally being followed by a rinsing operation.

In one preferred embodiment of the invention, the compositions according to the invention are used as shampoos for washing and treating the hair and the scalp.

In this case, they are applied to wet or dry hair in amounts which are effective for washing them, this application being followed by a rinsing operation.

The examples which follow illustrate the present invention without, however, being limiting in nature.

In the examples which follow, the following definitions apply:

Compound A: 3-iodo-2-propynyl butyl carbamate, and

Compound B: 3-(2-ethylhexyloxy)-1,2-propanediol

#### Example I: Antidandruff lotion

Compound A	0.1	g	AM
Compound B	0.2	g	
95° ethanol	30	g	
Water	qs	100	g

This solution is applied daily at a rate of 6 ml to the scalp for 1 to 2 weeks. A considerable improvement in the state of the dandruff is thus

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observed.

**Example II: Antidandruff shampoo**

Compound A	0.1	g AM
Compound B	1.0	g
Sodium lauryl ether sulphate (2.2 EO)	14	g AM
Cocylbetaine	2.4	g AM
Water	qs	100 g

This shampoo is used daily at a rate of 10 g per scalp with an exposure time of about one minute, and for a period of 2 weeks. A marked improvement in the state of the dandruff is thus observed.

**Example III: Antidandruff shampoo**

Compound A	0.1	g AM
Compound B	1.0	g
Sodium lauryl ether sulphate (2.2 EO)	8	g AM
C <sub>8</sub> /C <sub>10</sub> /C <sub>12</sub> /C <sub>14</sub> alkyl polyglycoside (1,4)	6	g AM
Water	qs	100 g

This shampoo is used daily at a rate of 10 g per scalp with an exposure time of about one minute, and for a period of 2 weeks. A marked improvement in the state of the dandruff is thus observed.

**Example IV: Determination of the antifungal activity of the combination of compounds (A) and (B)**

The activity of the combination of compound (A) and compound (B) was determined by a conventional method known as the MIC (Minimum Inhibitory Concentration), the MIC corresponding to the concentration at which a given

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protein inhibits the growth of a given strain under defined conditions.

In this instance, strains of *Pityrosporum ovale* from the Institut Pasteur, reference CIP 1363.82, were used.

An inoculum of a fresh culture, of  $1$  to  $10 \times 10^7$  cells/ml, is introduced into a Sabouraud + Tween 40 at  $10$  g/l + glyceryl monooleate at  $2.5$  g/l agar medium, in the presence or absence of the compound or of the combination of the compounds to be studied, and incubated for 48 hours at  $30^\circ\text{C}$ .

The concentration of the compound or combination of compounds above which the growth of the microorganism is completely inhibited (absence of cloudiness of the medium) is thus determined.

For compound (A) by itself and compound (B) by itself, not combined together, at the concentration MIC/2, the growth is identical to that of the control medium, i.e. the medium without any antibacterial compound.

On the other hand, the growth is blocked by the combination of compound (A) at MIC/2 + compound (B) at MIC/2.

These results thus show that this combination of compounds, at doses at which each of their individual activities is lost, remains effective and shows reinforced antifungal activity.

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